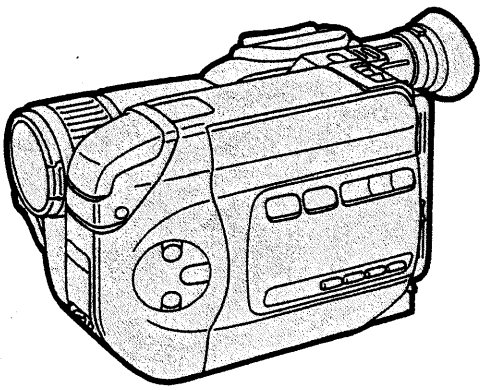
VHS-C Movie

NV-S6E/B/A
NV-S600EN



SPECIFICATIONS

ITEM	SPECIFICATION
POWER	Source: DC 6.0 V Consumption; Recording mode; 7.0 W (Battery operation)
VIDEO RECORDING SYSTEM	4 rotary heads, helical scanning system PAL
TAPE FORMAT	VHS-C Cassette Tape (Tape width 12.7 mm)
TAPE SPEED	SP mode: 23.39 mm/s LP mode: 11.7 mm/s Record/Playback Time: SP mode: 45 min. with NV-EC45E LP mode: 90 min. with NV-EC45E FF/REW Time: less than 6.5 min. with NV-EC45E
CAMERA	PICK-UP ELEMENT: CCD (Charge Coupled Device)
	STANDARD ILLUMINATION: 1,400 lux
	MINIMUM REQUIRED ILLUMINATION: 20 lux
	LENS: 8 : 1 Power Zoom Lens with Digital AI Auto Focus, Auto Iris, Auto Focus System, F1.4 (6~48 mm), Filter Diameter 37 mm
	IMAGE SENSOR: 1/3 inch CCD Image Sensor
	VIEW FINDER: 2/3" Electronic View Finder

ITEM	SPECIFICATION
VIDEO	HEADS: 4 rotary heads, 1 flging erase head
	OUTPUT: PHONO CONNECTOR; 1.0 Vp-p 75Ω unbalanced
AUDIO	HEAD: 1 Stationary head (Normal-Mono) 4 rotary heads; 2 channels (Hi-Fi Sound-Stereo)
	OUTPUT: PHONO CONNECTOR; −8 dB, 47 kΩ unbalanced
	INPUT: MIC IN (M3); −70 dB 4.7 kΩ or more unbalanced
WEIGHT	Approx. 710 g (without Battery Pack)
DIMENSIONS	101 (W) × 114 (H) × 197 (D) mm
STANDARD ACCESSORIES	1 pc. AC Adaptor 1 pc. Battery Pack 1 pc. Cassette Adaptor 1 pc. Shoulder Strap 1 pc. AV Output Cable 1 pc. DC Input Cable 1 pc. Battery for Cassette Adaptor Operation 1 pc. Battery for Clock Operation 1 pc. Phono/BNC Plug (NV-S6B) 1 pc. RF Adaptor (NV-S6B/A, NV-S600EN) 1 pc. Soft Case (NV-S6B)

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Panasonic

Controls and Functions

1 Operation Switch [OPERATE]

Set this switch to "CAMERA" for shooting.
Set it to "VTR" for playback.
To turn the Movie Camera off, set it back to the centre "OFF" position.
("VTR" means Video Tape Recorder.)

2 Operation Lamp
It lights up when the Operation Switch is set to "CAMERA" or "VTR".

3 Cassette Eject Button [EJECT]
Press this button to open the cassette compartment.

4 Viewfinder
The subject in front of the camera can be seen on the viewfinder screen. Superimposed on the picture are indications about the operation and condition of the Movie Camera.
To be able to see the picture on the viewfinder screen with maximum magnification during shooting and playback, pull on the plastic ring behind the Eyecup to extend the Viewfinder.
The Viewfinder can be turned upward from its horizontal position by up to 90°.

5 Shoulder Strap Holders
Attach the Shoulder Strap to these two holders.

6 Eyepiece Corrector Ring
Turn it clockwise or counterclockwise so that the indications in the Viewfinder are clearly focused.

7 Eyecup

8 Snapshot Button [SNAPSHOT REC]
Press this button for shooting a still picture for approx. 5 seconds.
To be able to press this button, the Movie Camera must be in the shooting pause mode ([OPERATE] Switch is set to "CAMERA").

9 Zoom Button [W] and [T]
Press the [W] Button lightly to zoom out gradually to the wide-angle position for panoramic shots; press the [T] Button lightly to zoom in gradually to the telephoto position for close-up shots of distant subjects.

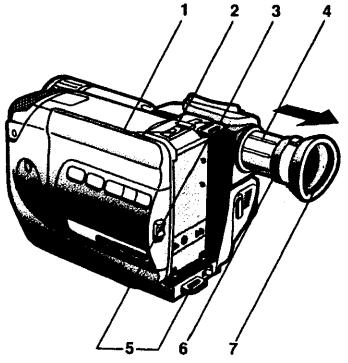
For faster zooming, press the [W] or [T] Button more strongly.

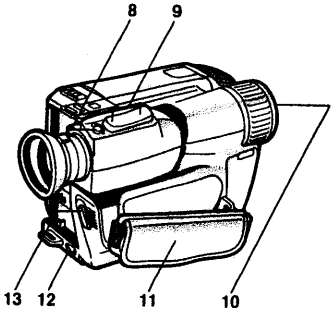
10 Lens Cap
The Lens Cap protects the Lens.
Be sure to remove the Lens Cap before starting to shoot.

11 Grip Belt
Adjust the length of this belt so that the grip fits comfortably into the palm of your hand.

12 Battery Pack Eject Lever [BATT.EJECT]
Slide this lever to the right to remove the Battery Pack.

13 Start/Stop Button
Press this button to start shooting a scene. (It is not necessary to keep it pressed during shooting.) Press it again to finish shooting the scene and change the Movie Camera back to the shooting pause mode.





Controls and Functions (cont'd)

14 Stereo Microphone
On the Hi-Fi sound track, stereo sound will be recorded. The two-way microphone is highly effective for recording interviews with the local ambience as well as narrations and music.

15 External Microphone Socket
If you want to use an external microphone, connect it to this socket (in this case, the built-in microphone will be deactivated).

16 Digital Effect Button [EFFECT]
Use this button for the following 3 operations.
Pressing this button repeatedly changes the operation mode in the following order:

1) For still picture shooting:	Press once.
2) For strobe picture shooting:	Press twice.
3) For mirror picture shooting:	Press three times.
4) To return to normal shooting:	Press one more time.

17 Digital Zoom Button [ZOOM]
Press this button to increase the power of the zoom function.

1) For zooming with up to 12-time enlargement:	D.ZOOM 1
2) For zooming with up to 36-time enlargement:	D.ZOOM 2

The picture can be enlarged by up to 12 or 36 times compared with the maximum wide-angle setting of the zoom lens in the normal zoom mode.

18 Digital Image Stabilizer Button [STABILIZER]
Press this button when you are shooting on the move, from a vehicle for example.

19 Cassette Compartment
Insert a VHSC or S-VHSC compact video cassette into this compartment.

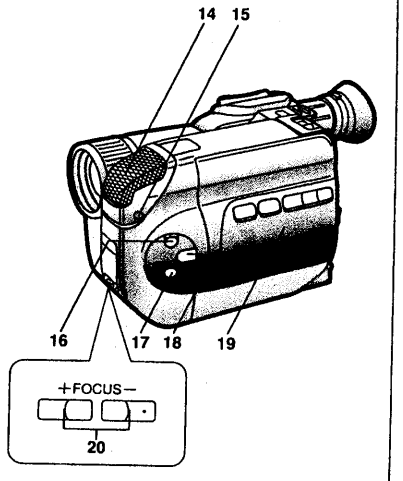
20 Focus +/– Buttons [FOCUS +/–]
After selecting the manual focusing mode with the [FOCUS] Button, adjust the focus to the desired subject by pressing these buttons.

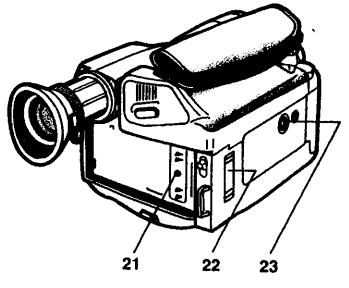
21 DC Input Socket
When using the AC Adaptor or the Car Battery Cord (optional) as power supply instead of the Battery Pack, connect the DC Input Cable to this socket.

22 Button Type Battery Holder
It holds the Button Type Battery (CR2032) that maintains the clock operation and keeps the title in memory while the Movie Camera is turned off.

23 Tripod Receptacle
When using a tripod for stable shooting, attach the screw of the tripod to this receptacle.

Note:
When attaching a non-Panasonic brand tripod, ensure that the length of the mounting screw is no more than 7 mm, to avoid damage to the Movie Camera.





Controls and Functions (cont'd)

24 Fade Button [FADE]
Press this button to fade out a scene and to fade in the following scene for a soft scene-to-scene transition.

25 Date/Time Button [DATE/TIME]
Press this button to make the time and/or date appear in the Viewfinder and superimpose them onto the picture during shooting.

26 Title Button [TITLE]
Press this button to make the memorised title appear in the Viewfinder; press it again to clear it from the Viewfinder. Pressing this button repeatedly will make the title appear, disappear, appear in the Viewfinder.

27 Memory Button [MEMORY]
Press this button to input a title into the memory.

28 Title/Mode/Colour Selector Button [T.MODE/COLOUR]

- After making the memorised title disappear from the Viewfinder...
 Press this button to select the "WIPE ↓" "WIPE ↑" or "SCROL" superimposing mode for the memorised title instead of the normal superimposing mode.
- After making the memorised title appear in the Viewfinder...
 Press this button to select the colour in which you want the memorised title to be superimposed onto the picture. You can choose any of 8 colours available.

29 Mode Selector Switch [AUTO/MANUAL]

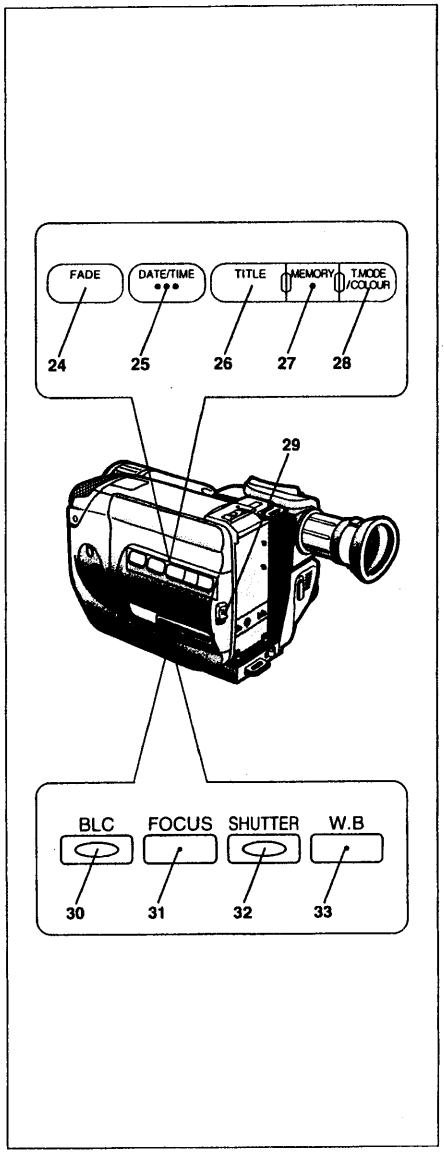
Set this switch to "AUTO" for almost any shooting condition. Set this switch to "MANUAL" when any of the following functions need to be set or selected manually;
- The Backlight Compensation Function
- The Focus Adjustment Function
- The High Speed Shutter Function
- The White Balance Adjustment Function

30 Backlight Button [BLC]
Press this button to brighten up the subject when shooting a backlit scene. By pressing it repeatedly, the degree of backlight compensation can be varied in three steps.

31 Focus Button [FOCUS]
Press this button to select manual focus adjustment for shooting.

32 Shutter Speed Selector Button [SHUTTER]
Press this button to select a higher shutter speed when shooting scenes with fast movements.

33 White Balance Button [W.B]
Press this button to select manual white balance adjustment for shooting.



Controls and Functions (cont'd)

34 Tracking/Date/Time Shift Button [DATE/TIME SHIFT • TRACKING]
Use this button for the following operations:
1) Press it to advance to the next item during the setting of the time and date.
2) Press it when you want to adjust the tracking manually.

35 Recording Speed Selector Switch [SP/LP]
Set this switch to select the desired tape speed. (SP/LP)

36 Pause Button [PAUSE]
Press this button during playback to be able to watch a still picture; press it again to resume normal playback.

37 Stop Button [STOP]
Press this button to stop the playback.

38 Rewind/Review Button [REW/⏪]
Use this button for the following operations:
1) With the [OPERATE] Switch set to "CAMERA":
 Press it briefly after shooting a scene in order to play back the last few seconds of the recording for quick confirmation that the recording is okay. When this button is kept pressed, the recorded scene is played back at high speed in reverse direction.
2) With the [OPERATE] Switch set to "VTR";
 Press it to rewind the tape from the stop mode.
 Keep it pressed during playback for high-speed playback in reverse direction.

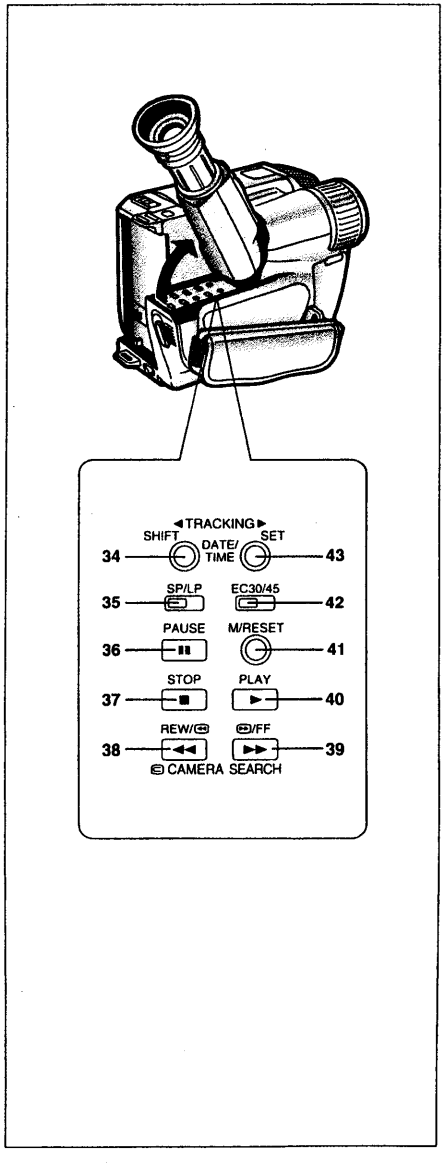
39 Fast Forward/Cue Button [⏩/FF]
1) With the [OPERATE] Switch set to "CAMERA":
 When this button is kept pressed, the recorded scene is played back at normal speed in forward direction.
2) With the [OPERATE] Switch set to "VTR";
 Press this button to wind the tape forward at high speed from the stop mode.
 Keep it pressed during playback for high-speed playback in forward direction.

40 Play Button [PLAY]
Press this button to start the playback.

41 Memory Reset Button [M/RESET]
Use this button for the following operations:
1) Press this button for more than one second to reset the tape counter to "0:00.00".
2) Press this button briefly (for about 0.5 seconds) to activate the tape counter memory function so that the tape position corresponding to the tape counter indication "M 0:00.00" can be found easily during fast-forwarding or rewinding of the tape.

42 Remaining Tape Time Selector Switch [EC30/45]
Set this switch to select the length of the cassette tape that is used for shooting or playback.

43 Tracking/Date/Time Set Button [DATE/TIME SET • TRACKING]
Use this button for the following operations:
1) Press it to change the figures during the setting of the time and date.
2) Press it when you want to adjust the tracking manually.



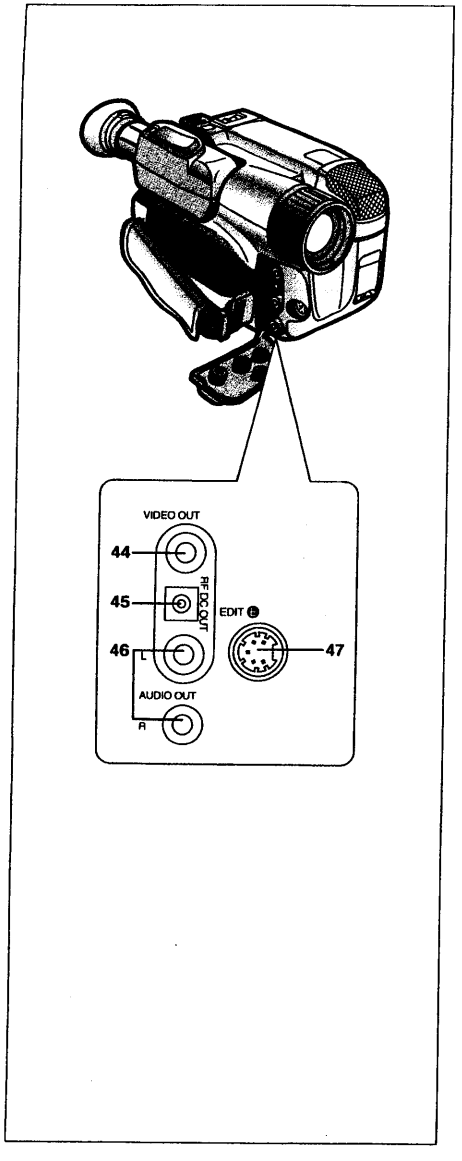
Controls and Functions (cont'd)

44 Video Output Socket
Connect this socket via AV Output Cable to the video input socket of the TV set (or the RF Adaptor) for playback directly from the Movie Camera.

45 RF DC Output Socket
Connect this socket with the RF Adaptor to supply it with power for playback directly from the Movie Camera.

46 Audio Output Sockets
Connect this socket via audio cable with the audio input socket of the TV set (or the RF Adaptor) for playback directly from the Movie Camera.

47 Edit Socket
Connect an Editing Controller, or some other accessory to this socket.



Using the Battery Pack

1) Charge the Battery Pack

1 **Insert the upper end of the Battery Pack into the connector on the AC Adaptor as shown in the illustration.**

2 **Press the rear portion down until it locks with a click.**

3 **Connect the Power Cable of the AC Adaptor to the mains.**
- The Power Lamp ❶ lights up and several seconds later the Charging Lamp ❷ lights up, too.

Note:
When charging the Battery Pack, disconnect the DC Input Cable from the AC Adaptor.

■ Charging Time and Maximum Time for Continuous Shooting

Battery Pack No.	VW-VBS1E VW-VBR1E	VW-VBS2E VW-VBR2E	VW-VBH1E	VW-VBH2E
Charging time in minutes	60	120	80	160
Max. shooting time in minutes	50	100	60	120

- The Battery Pack supplied with this Movie Camera is the model VW-VBS1.

Charging Indication Lamp:
This lamp lights up when the charging is started.
Even after this lamp goes out, the charging should be continued for at least two more hours to obtain maximum charge.

Operation Time:
With a fully charged Battery Pack (VW-VBS1E), the Movie Camera can be used (in record mode only) continuously for approx. 50 minutes at 25°C. However, depending on how often the various functions listed below are used, and depending on the shooting conditions, the actual operation time may be considerably shorter.
- Shooting start/stop
- Auto focus
- Zoom function
- Playback, fast forward, rewind, and other operations
- Digital functions, e.g. image stabilizer
- Use of the Movie Camera in low temperature

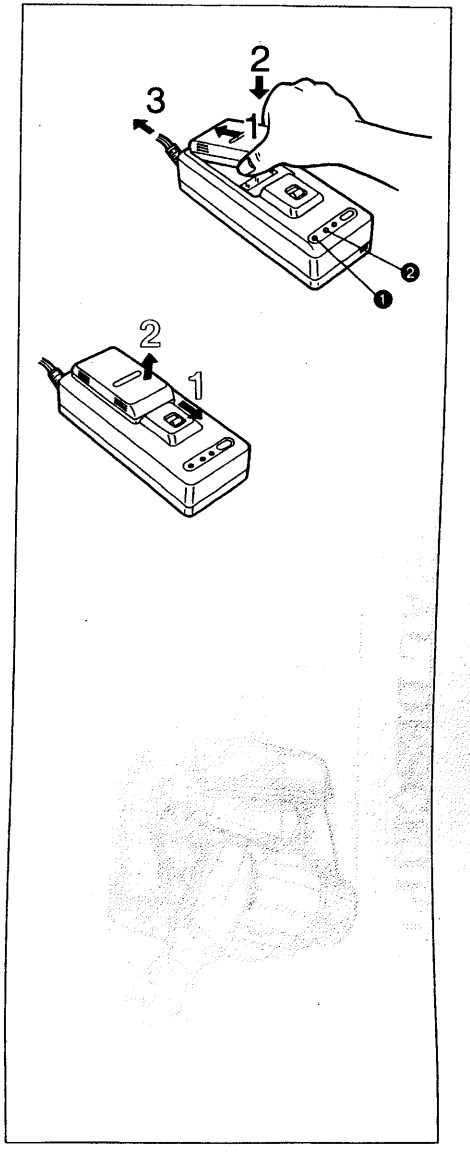
Therefore, it is recommended to take along a charged spare Battery Pack.

■ To Eject the Battery Pack...

1 **Slide the Battery Eject Lever in the direction of the arrow and...**

2 **Remove the Battery Pack.**

Notes:
The Battery Pack is shipped in discharged condition and must be charged before it can be used.
- Charge the Battery Pack within a temperature range of 10°C–35°C.



Using the Battery Pack (cont'd)

■ How to Use the Covenient Discharge→Charge Function

If a Battery Pack is recharged repeatedly in not completely discharged condition, the so-called "memory effect" will occur, and the operation time of the recharged Battery Pack will gradually become shorter. Therefore, it is recommended to regenerate the Battery Pack after approx. every fifth recharging by using the convenient Discharge→Charge Function.

1 **Attach the Battery Pack to the AC Adaptor.**

2 **Connect the Power Cable of the AC Adaptor to the mains.**
- The Power Lamp ❶ lights up, and soon after, the Charging Lamp ❷ lights up.

3 **Press the Discharge→Charge Button for more than 1 second.**
- The Discharge Lamp ❸ lights up, and the Charge Lamp ❷ goes out.

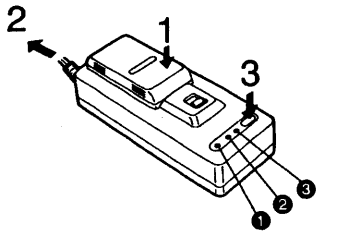
■ **When the discharging is finished**, the Charge Lamp ❷ lights up instead, and the charging starts.

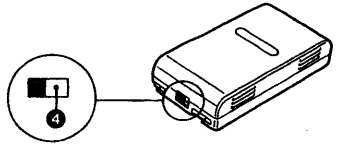
■ **When the charging is completed**, the Charging Lamp ❷ goes out.

Notes:
- To optimise the life of the Battery Pack, it is recommended to charge the Battery Pack model VW-VBS1E for a minimum of 3 hours and model VW-VBS2E for at least 6 hours. This does not include the "discharging time", when using the discharge function.
- When using the Discharge→Charge Function, the charging takes five or six times as long as normal charging.

■ How to Use the Charging Confirmation Marker

This marker makes it convenient to distinguish between charged and discharged Battery Packs. For example, slide the knob so that the dot ❹ is visible to mark a charged Battery Pack, and slide it so that the dot is not visible for a partially or fully discharged Battery Pack.





Using the Battery Pack (cont'd)

2) Attach the Battery Pack to the Movie Camera

■ How to Attach the Battery Pack

1 **Align the mark ❶ at the top of the Battery Pack with that on the Movie Camera ❷ and insert the Battery Pack with its upper part first.**

2 **Attach the Battery Pack until it locks with a click.**

■ How to Remove the Battery Pack

1 **Press and slide to "OFF".**

2 **After the image in the Viewfinder disappears, slide to the right and...**

3 **Pull off the Battery Pack.**
- When the Battery Pack is replaced, the modes previously set with the [BLC], [FOCUS], [SHUTTER] and [W.B] Buttons are cancelled and the Tape Counter Indication is reset to zero.

Caution:
- If the Battery Pack is removed during recording or playback, the tape remains wound around the video head cylinder and could become damaged.
 This is also the case during loading and unloading of the tape.

Using the AC Adaptor or the Car Battery Cord (optional)

■ How to Use the AC Adaptor

1 **Connect the DC Input Cable to the DC Input Socket on the Movie Camera.**

2 **Connect the other end of the cable to the DC Output Socket on the AC Adaptor.**

3 **Connect the Mains Cable of the AC Adaptor to the mains.**

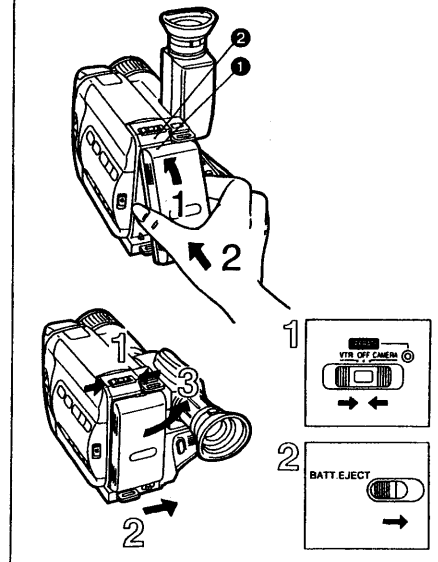
Note:
When the AC Adaptor is used to supply the Movie Camera with power, remove the Battery Pack from the AC Adaptor.

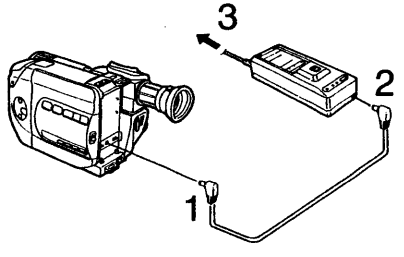
■ How to Use the Car Battery Cord (optional)

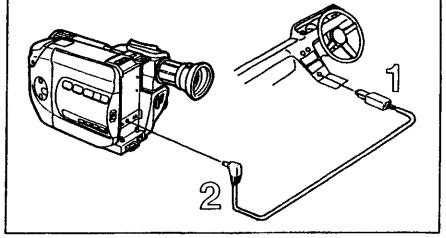
1 **Start the engine and then plug the Car Battery Cord into the cigarette lighter socket.**

2 **Connect the other end of the cord to the DC Input Socket on the Movie Camera.**

Notes:
- The Car Battery Cord can only be used with 12 V DC negative-grounded vehicles.
- Do not start the car engine while the Movie Camera is powered by the car battery.







Setting the Clock

1) Insert the Button Type Battery

The "CR2032" size Button Type Battery is necessary for storing the date, time and selected tape speed in the memory, when the Movie Camera is turned off.

1 Turn the Movie Camera upside down.

2 Push the two stoppers ❶ toward each other and pull out the Battery Holder ❷.

3 Install the Battery with the (+) mark facing downward until it locks with a click.

4 Insert the Battery Holder back into the Movie Camera until it locks.

- If the Button Type Battery is not inserted or if it is exhausted, the Indication " " in the Viewfinder flashes for approx. 10 seconds when turning the Movie Camera on.

■ How to Exchange the Button Type Battery

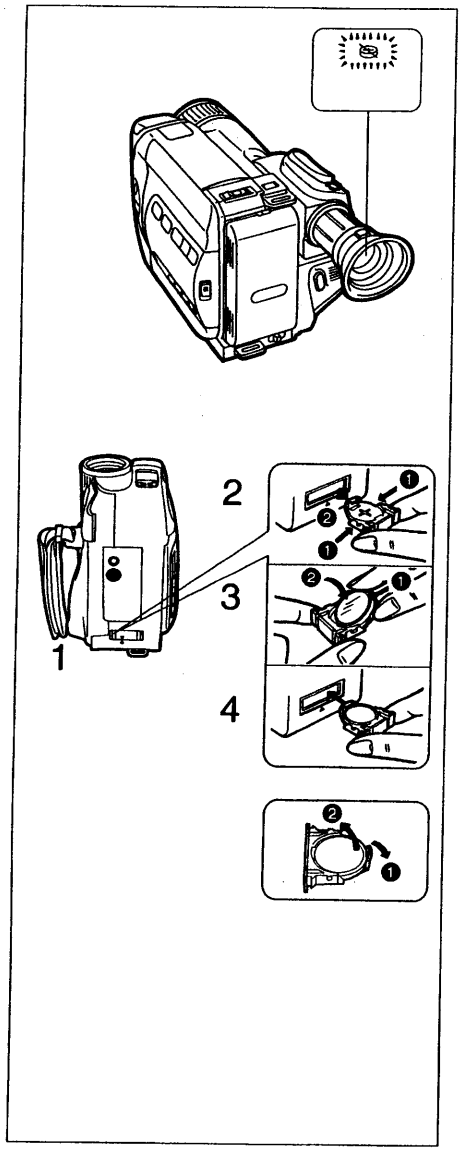
- Use only a "CR2032" size Button Type Battery.
- The CR2032 is manufactured by Panasonic only.

Note:

- If the Date and Time Indications in the Viewfinder are no longer correct after replacing the Button Type Battery, set the date and time.

CAUTIONS FOR BATTERY REPLACEMENT

- The life of the battery is about one year. Inspect, and if necessary, replace the Battery once a year.
- Load the new battery with its polarities (+ and −) correctly aligned.
- Remove the spent battery immediately and dispose of it.
- Do not try to short-circuit, recharge or heat the battery and do not throw it into a fire.
- Keep the button-type battery out of reach of children. If a battery has been swallowed, consult a doctor immediately.
- Do not handle the Button Type Battery with metallic tweezers because this could short-circuit it.



Setting the Clock (cont'd)

2) Set the Date and Time

1 Press and slide to "CAMERA".

2 Press.

3 Keep pressed for more than 2 seconds.

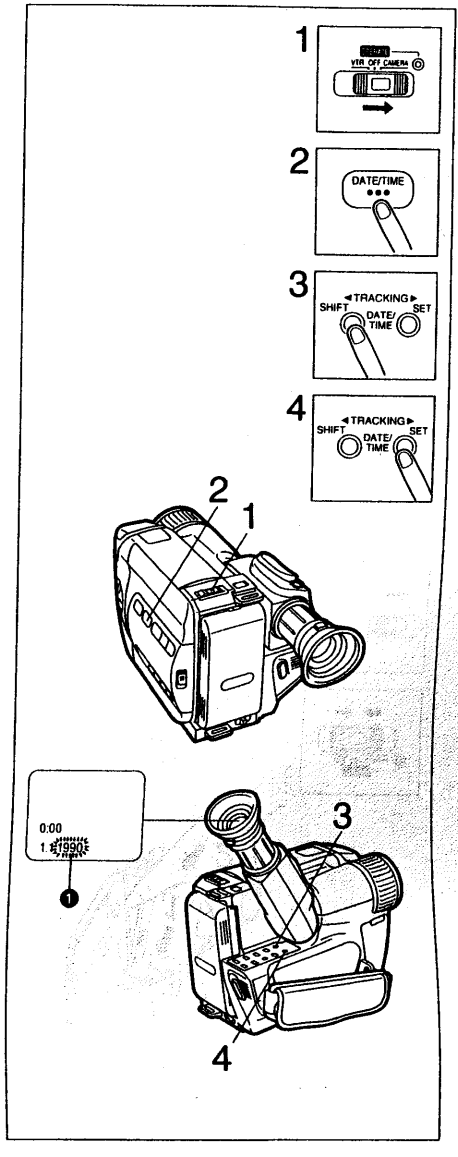
- The year portion ❶ of the Date/Time Indication starts to flash.
- The flashing portion of the Date/Time Indication can be changed with the [SHIFT] Button in the following order:

→Year→Month→Day→Hour→Minute→" "→

4 Press to change the figures.

Year:	1990→1991→ →2089→1990→...
Month:	1→2→ →12→1→...
Day:	1→2→ →31→1→...
Hour:	0→1→ →23→0→...
Minute:	00→01→ →59→00→...

- **Repeat procedures 3 and 4 until all items have been set correctly.**
- Once the date and time are set, press the [SHIFT] Button in response to an accurate time source so that the clock begins to function.

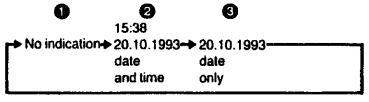


Recording the Date and Time during Shooting

During shooting, the Date/Time Indication displayed in the Viewfinder will also be recorded.

1 Press.

- Pressing the [DATE/TIME] Button repeatedly changes the Date/Time Indication ❷ in the Viewfinder in the following order:



- Press the [DATE/TIME] Button to select the desired indication.

Extending the Viewfinder/Adjusting the Eyepiece Corrector

1 Before shooting, extend the Viewfinder to its fully extended position ❶ (about 2 cm).

Note:
- Do not hold the Viewfinder by the Eyecup because it could become detached from the Viewfinder.

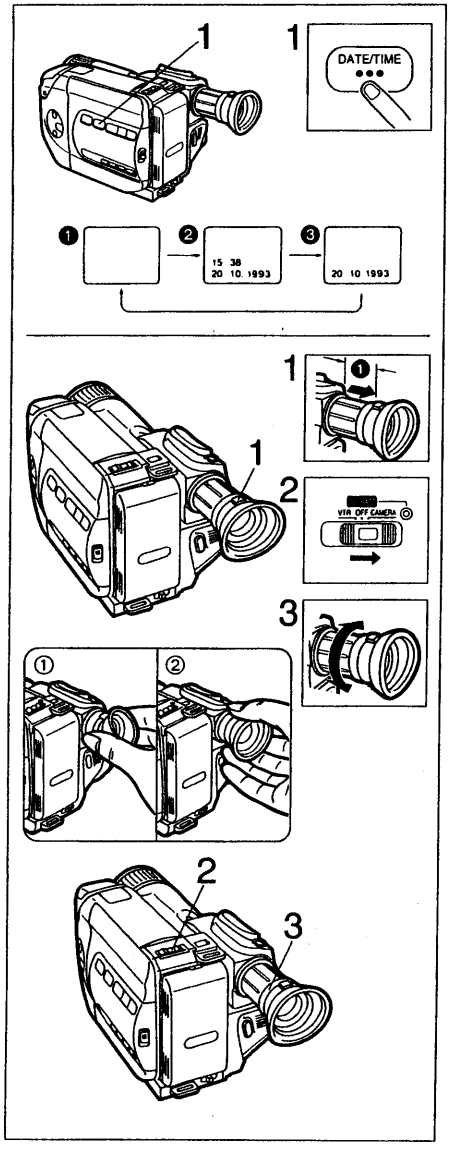
① Wrong

② Correct

2 Press and slide to "CAMERA".

3 Turn the Ring until the indications in the Viewfinder can be seen clearly.
- With the Eyepiece Corrector Control, the Eyepiece can be adjusted to your eyesight.

Note:
- Do not apply any pressure to the Viewfinder except when extending, raising, lowering and retracting it.



Adjusting the Grip Belt/Removing the Lens Cap

■ Adjusting the length of the Grip Belt

The length of the Grip Belt should be adjusted so that the Grip fits comfortably into the palm of your hand and the Start/Stop Button and the [W] and [T] Zoom Buttons can easily be pressed with the fingertips.

1 Unfasten the velcro tape closure.

2 Adjust the length to the size of your hand.

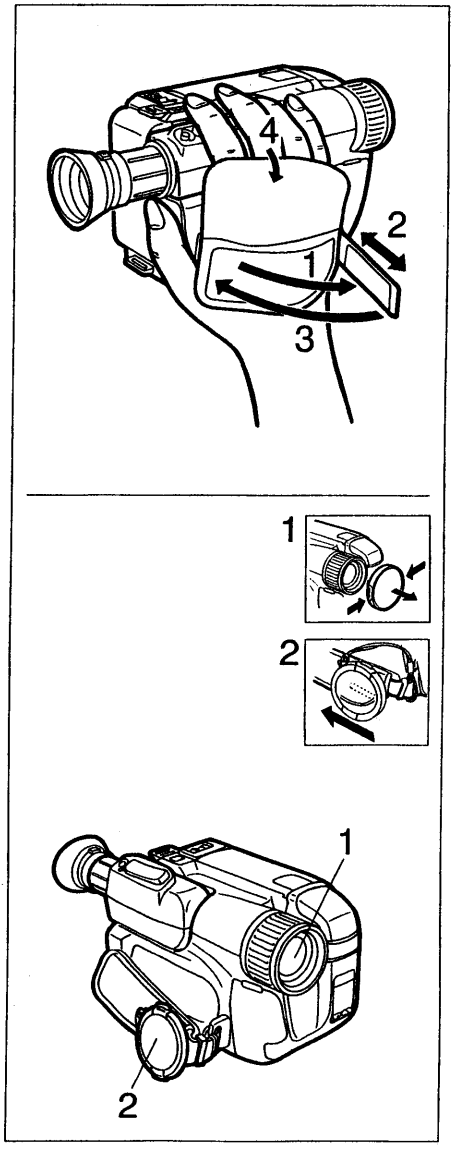
3 Fasten the velcro tape closure.

4 Fold the cover down over the Grip Belt.

■ Removing the Lens Cap

1 Press the Stoppers and pull it off.

2 Hook the Lens Cap onto the Grip Belt to prevent it from getting in front of the Lens.



Shooting with the Digital Image Stabilizer Function

This function automatically corrects the slight shaking of the camera that often occurs during hand-held camera shooting and zooming.
It is especially practical for the following shooting situations:
- Zooming in on a distant subject.
- Shooting while walking.
- Shooting from inside a moving car.

1 Press.

The Image Stabilizer Function is activated with the [STABILIZER] Button.
- When the Image Stabilizer Function is activated, the Indications ❶ (Image Stabilizer Indication "✋" and Shutter Speed Indication "1/120") appear in the Viewfinder.

2 Press.

- The recording starts.

■ To Cancel this Function...
Press the [STABILIZER] Button.

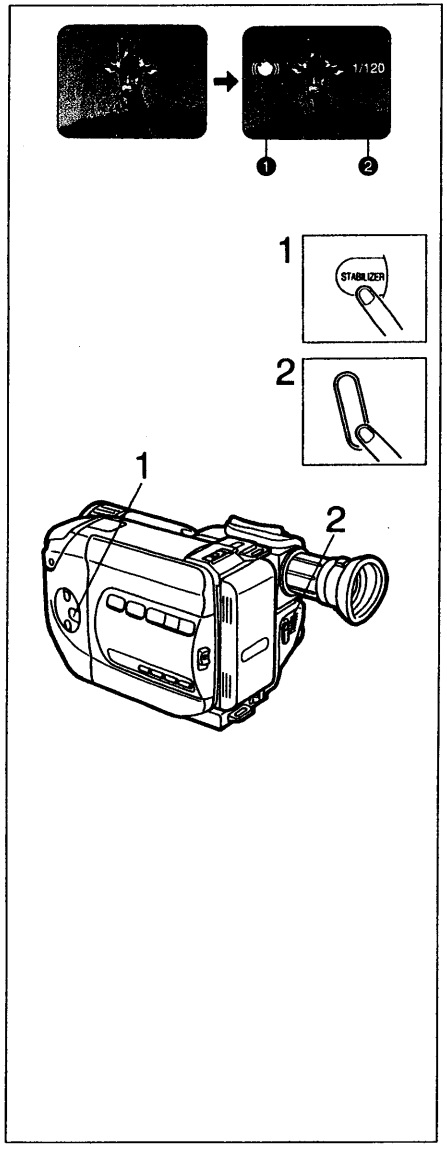
Notes:
- The subject appears slightly enlarged in the Viewfinder.
- The shutter speed is set to 1/120 second (the "1/120" Indication ❷ is displayed in the Viewfinder) instead of the normal 1/50 second (for which there is no indication).
- When shooting under weak illumination, the "✋" Indication flashes to indicate that the Image Stabiliser Function does not work.

Notes on Shooting with the Image Stabilizer Function

■ Shooting Conditions...
- The picture stabilizing effect may not be sufficient, if the shaking of the Movie Camera is very strong, or in the following shooting conditions:
 —A subject with horizontal or vertical stripes.
 —An extremely bright subject.
 —A subject under many fluorescent lamps.
 —A fast-moving subject.
- When shooting under fluorescent light, the brightness of the picture may fluctuate.
- The resolution of the picture will be slightly reduced.

■ Shooting with the High-Speed Shutter...
- When the Image Stabiliser Function is cancelled, the Shutter Speed is reset to 1/50, however if the [SHUTTER] Button is pressed to change the shutter speed while the Movie Camera is in the Image Stabiliser Mode, the shutter speed will remain at this setting when the Image Stabiliser Mode is cancelled.

■ Shooting with a Tripod...
- When shooting with a tripod, do not use the Image Stabilizer Function.



Taking a Snapshot

Using the Digital Shooting Function

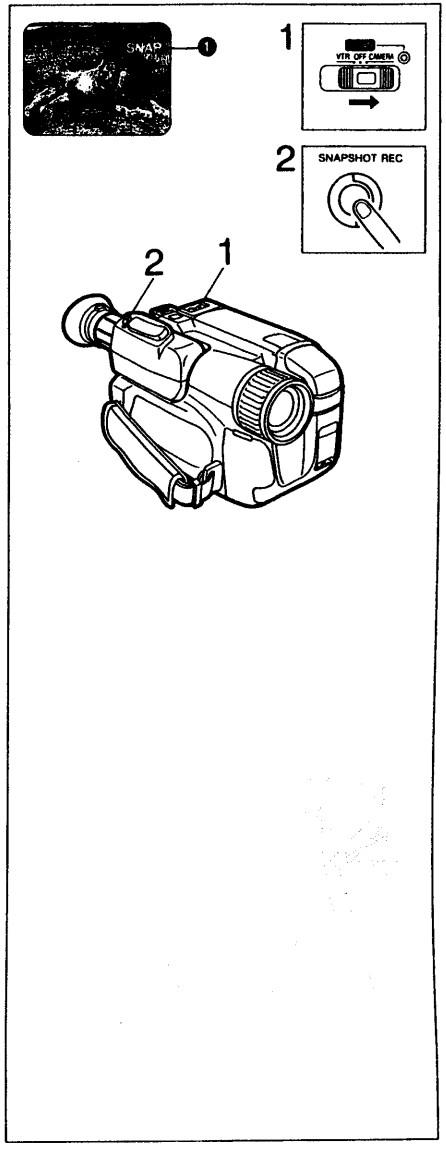
- By pressing the [SNAPSHOT REC] Button, a still picture can be recorded for approx. 5 seconds.
 Since anyone can use this Movie Camera with the same ease as a photo camera, it's easy to ask somebody to take your picture by pressing the [SNAPSHOT REC] Button. This makes it even easier for you to get into your own video movies.

1 Press and slide to "CAMERA".

2 Press.

- During the snapshot shooting, the "SNAP" Indication ❶ is displayed in the Viewfinder.
- The still picture will be recorded for approx. 5 seconds and the Movie Camera will then switch back to the shooting pause mode.

Hints for Shooting Snapshot Pictures
By combining this function with the High-Speed Shutter Function, it is possible to shoot still pictures of fast actions for motion analysis.
- To prevent picture distortion, do not move or shake the Movie Camera during Snapshot Recording.
- Since the still picture is recorded from the digital image memory, the picture quality may be slightly inferior to that of normally recorded pictures.
- When the Snapshot Recording Function is used repeatedly, wait at least 2 to 3 seconds before pressing the [SNAPSHOT REC] Button again.



Shooting a Still Picture

Using the Digital Shooting Function

For Recording a Still Picture of any Desired Duration:

1 Press and slide to "CAMERA".

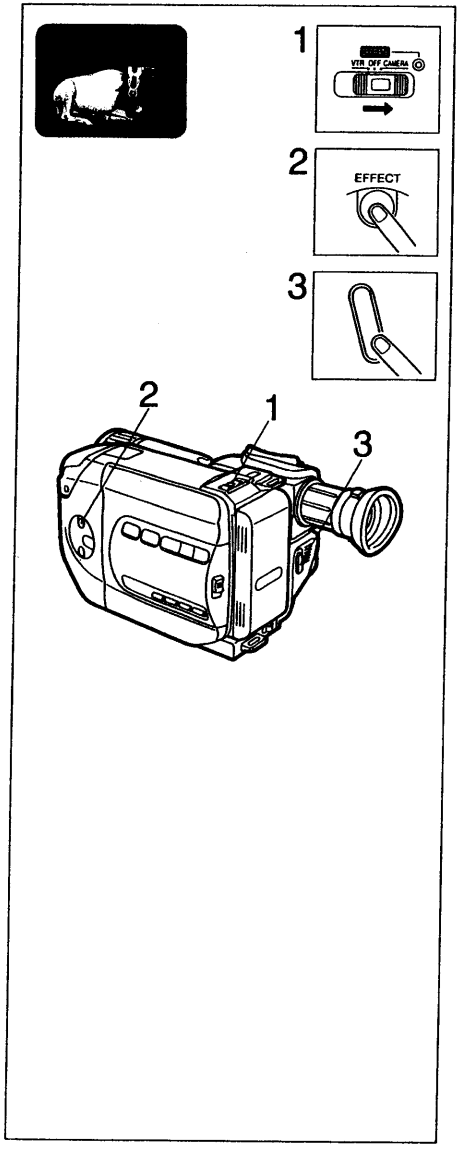
2 Press.
- The image in the Viewfinder stands still.
- By pressing the [EFFECT] Button repeatedly, the mode can be changed in the following order:

┌→NORMAL→STILL→STROBE→ MIRROR┐

3 Press.
- The still picture in the Viewfinder will be recorded.

■ To Cancel this Function...
Press the [EFFECT] Button three times until normal movement in the Viewfinder is observed.

Hints for Shooting Still Pictures
- To prevent picture distortion, do not move or shake the Movie Camera during still picture shooting.
- Since the still picture is recorded from the digital image memory, the picture quality may be slightly inferior to that of normally recorded pictures.



Shooting with Strobe Effect

Using the Digital Shooting Function

For continuously recording 6 still images per second:

1 Press and slide to "CAMERA".

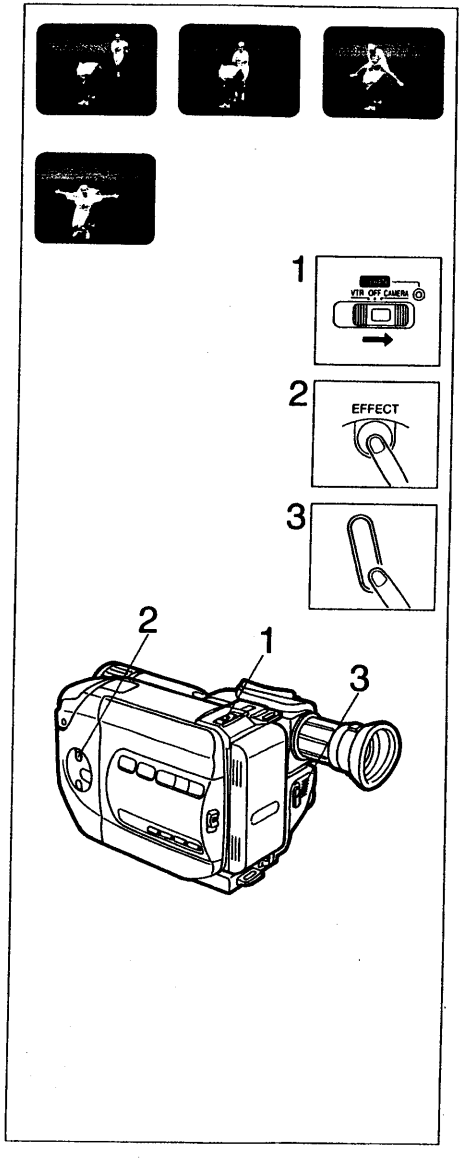
2 Press Twice.
- The picture in the Viewfinder will also have a strobe effect.

3 Press.
- Continuous shooting with strobe effect is now possible.

■ To Cancel this Function...
Press the [EFFECT] Button twice until normal movement in the Viewfinder is observed.

Hints for Shooting Pictures with Strobe Effect
By combining the Strobe Function with the High-Speed Shutter, the strobe effect can be increased. (For outdoor shooting, the 1/250-second shutter speed is recommended.)

Notes:
- When shooting under fluorescent lamps, the brightness of the picture may fluctuate.
- Since the strobe pictures are recorded from the digital image memory, the picture quality may be slightly inferior to that of normally recorded pictures.



Shooting with the Mirror Effect

Using the Digital Shooting Function

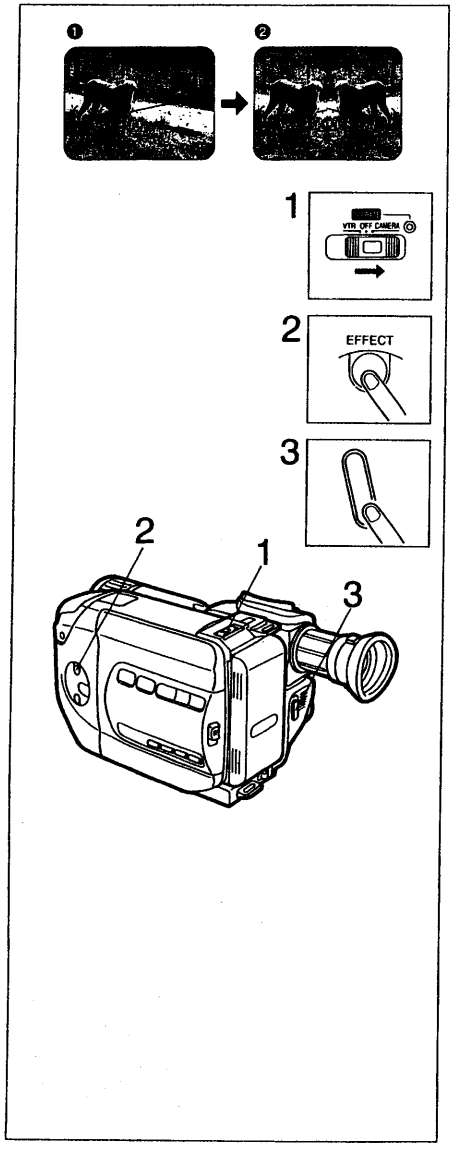
When recording a moving picture in the Mirror Mode, the right half of the picture is a mirror image of the left half ❷.

1 Press and slide to "CAMERA".

2 Press three times.
- The right half of the picture ❶ in the Viewfinder is now a mirror image of the left half.

3 Press.
- The mirror image is now being recorded.

■ To Cancel this Function...
Press the [EFFECT] Button once until normal movement in the Viewfinder is observed.
- Since the picture is recorded from the digital memory, the picture quality may be slightly inferior to that of normally recorded pictures.



Shooting with the Zoom Function

Using the Power Zoom Function

To make your zoom shots more impressive and to achieve exactly the desired effect, do it like the professionals: before actually shooting, make a trial run of the zooming.

1 Keep pressed for telephoto.
(subject appears closer ❶)

Keep pressed for wide-angle.
(subject apears farther away ❷)

The zoom speed can be varied in 2 steps.
For faster zooming, press the [W] or [T] Button strongly.
For slow zooming, press either of these buttons lightly.

■ Using the Digital Zoom Function

The digital Zoom Function makes it possible to zoom in on a subject and enlarge it by up to 36 times by using the [ZOOM] Button and the [T] Zoom Button.

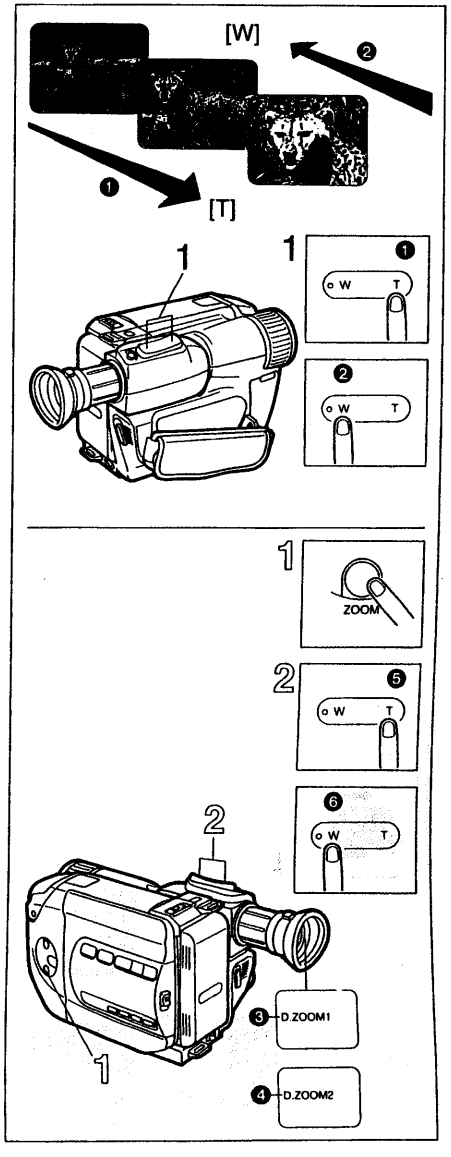
3 zoom ranges can be selected as follows.
×1↔×8 No indication.
×1↔×12 "D.ZOOM 1"
×1↔×36 "D.ZOOM 2"

1 Press and select the desired zoom range.
- When the "D.ZOOM 1" Indication ❸ appears in the Viewfinder, the zoom range is expanded to up to ×12.
- When the "D.ZOOM 2" Indication ❹ appears in the Viewfinder, the zoom range is expanded to up to ×36.

2 Press ❺ or ❻.
- The Magnification Ratio Indication is displayed in the Viewfinder.
 The figure corresponding with the selected magnification is displayed and it changes only when the [W] or [T] Button is kept pressed.

■ To Cancel this Function...
Press the [ZOOM] Button once or twice.
- The "D.ZOOM 1" or "D.ZOOM 2" Indication disappears in the Viewfinder.

Notes:
- When the Digital Zoom Function is turned off, the zoom range is limited to ×8.
 However, when the Digital Image Stabilizer Function is activated, the zoom range is extended to up to ×9.
- When the Digital Zoom Function is activated, the picture is magnified electronically.
- The Digital Zoom Function slightly decreases the picture resolution and fine picture details.
- When zooming in on a subject all the way to the maximum tele position, slight after-image distortion may occur.
- When zooming in the extreme tele range (near the 36× setting, using the Digital Zoom) while the Image Stabilizer Function is activated, slight after-image distortion may occur.
 When shooting under very bright conditions, the after-image can be eliminated by selecting a shutter speed of 1/250 or 1/1500 sec.



Shooting Backlit Scenes

This function makes it possible to brighten up the subject when shooting a backlit scene, e.g. people outdoors with the sun in their back, or a person indoors in front of a window.

1 Set the Mode Selector Switch to "MANUAL".

2 Press to select the degree of the backlight compensation according to the backlight conditions.

- The " ⬭ " Indication appears ❷ in the Viewfinder.

By pressing the [BLC] Button repeatedly, the brightness of the picture can be increased in 3 steps.

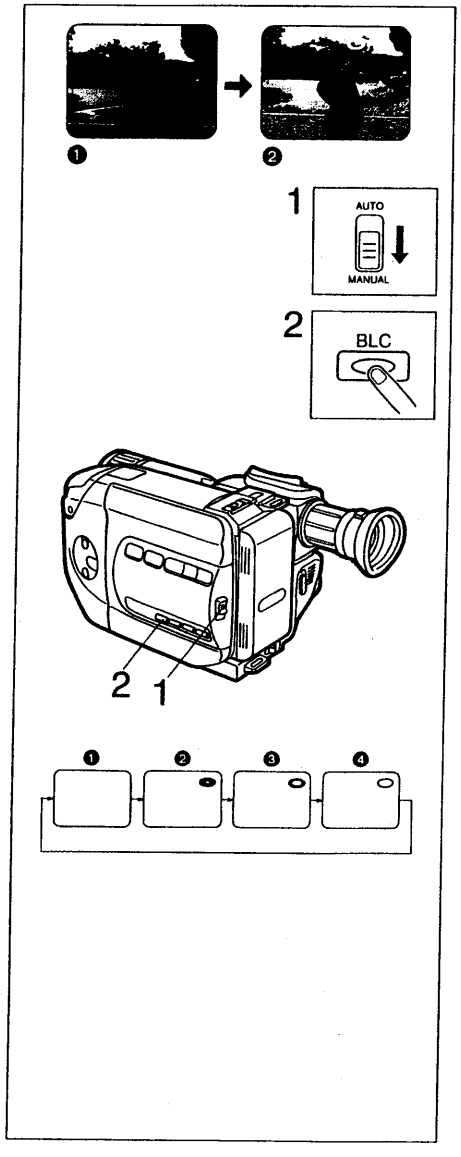
❶ No backlight compensation
↓
❷ Low backlight compensation
↓
❸ Medium backlight compensation
↓
❹ High backlight compensation

■ To Return to the Standard Iris Setting...

- Press the [BLC] Button repeatedly until neither the " ⬭ ", " ⬭ " nor " ⬭ " Indication in the Viewfinder is displayed any longer.
- Returning to the standard iris setting is also possible by setting the Mode Selector switch to "AUTO". (The Focus, High Speed Shutter and White Balance modes can also be reset to "AUTO" in this way.)

Cautions for Shooting Backlit Subjects

- The sky may become whitish.
- In case of extremely strong backlight, it may not be possible to brighten up the subject sufficiently.
- When shooting with the sun striking the subject at an angle, star shaped figures may be recorded due to reflection of the light.



Shooting Fast-Moving Subjects

Using the High-Speed Shutter Function

A range of different high shutter speeds makes it possible to shoot scenes with fast movements. When scenes recorded with a high shutter speed are later played back on a VTR equipped with super still and super fine slow motion functions, still and slow motion playback with very sharp picture contours and brilliant details can be obtained.

1 Set to "MANUAL".

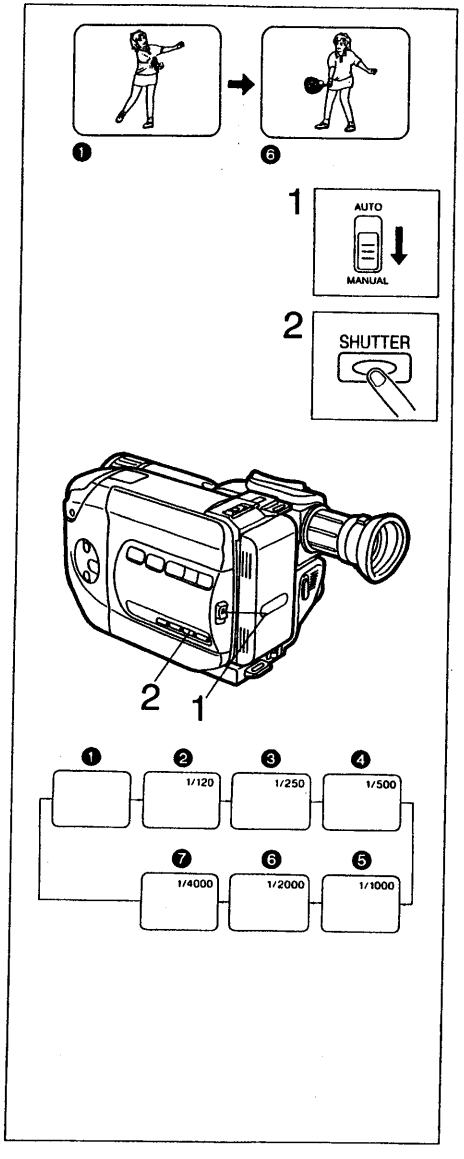
2 Press repeatedly to select the desired shutter speed.

- The shutter speed changes in the following sequence.

❶ 1/50 (No indication) Normal → ❷ 1/120 → ❸ 1/250 → ❹ 1/500 → ❺ 1/1000 → ❻ 1/2000 → ❼ 1/4000 → ❶

Conditions for Shooting with the High-Speed Shutter

- The subject must be brightly lit by sunlight or other strong illumination, with little shade.
- When shooting under fluorescent lamps, the picture will be adversely influenced by flickering.
- When the picture is played back in the normal playback mode, the picture movement may not be as smooth as normally.
- The playback picture will be slightly darker than the picture recorded without using the High-Speed Shutter Function.



Inputting a Title into the Memory

Using the Digital Title Memory Function

- The Digital Title Memory Function makes it possible to input a title into the memory, to recall it later during shooting by pressing a button and to superimpose it onto the normal moving picture.
- Inputting a title into the memory can be performed while the Movie Camera is in the shooting pause mode.

1 Prepare a title.
- The title should have strong contrast (e.g. title written with black felt pen on white paper, printed title, street sign, calendar).

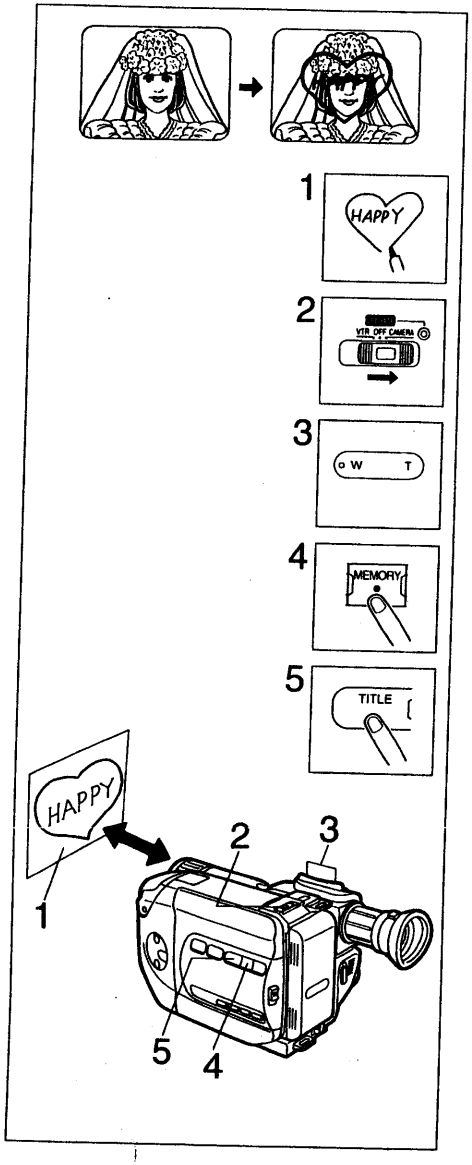
2 Press and slide to "CAMERA".

3 Adjust the focus.
- For small titles, use the Marco Close-up Function.
- The title should be in the centre of the Viewfinder screen because a part at the top and bottom edge of the title image will be cut off when it is superimposed during shooting.

4 Press for at least half a second.
- The title is memorised.

5 Press to make the title disappear from the Viewfinder.
- Pressing this button repeatedly will make the title appear, disappear, appear in the Viewfinder.

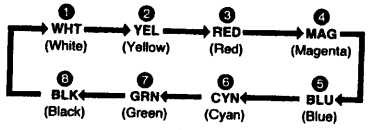
Notes:
- The title remains in the memory until a new title is input [or until the Button Type Battery (back-up) is exhausted].
- If the [TITLE] Button is pressed by mistake during shooting, the title will be superimposed and recorded.



Selecting the Title Colour

1 Press.
- The memorised title appears in the Viewfinder.

2 Press repeatedly to select the colour.
- By repeatedly pressing this button, the colour of the title can be changed in the following order. (This function can also be used while the title is already being recorded.)

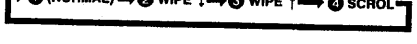


Notes:
- Input a title into the memory before selecting the title colour.
- The title colour cannot be selected when the title is not displayed in the Viewfinder.

Selecting the Title Mode

1 Press again to make the title disappear from the Viewfinder.

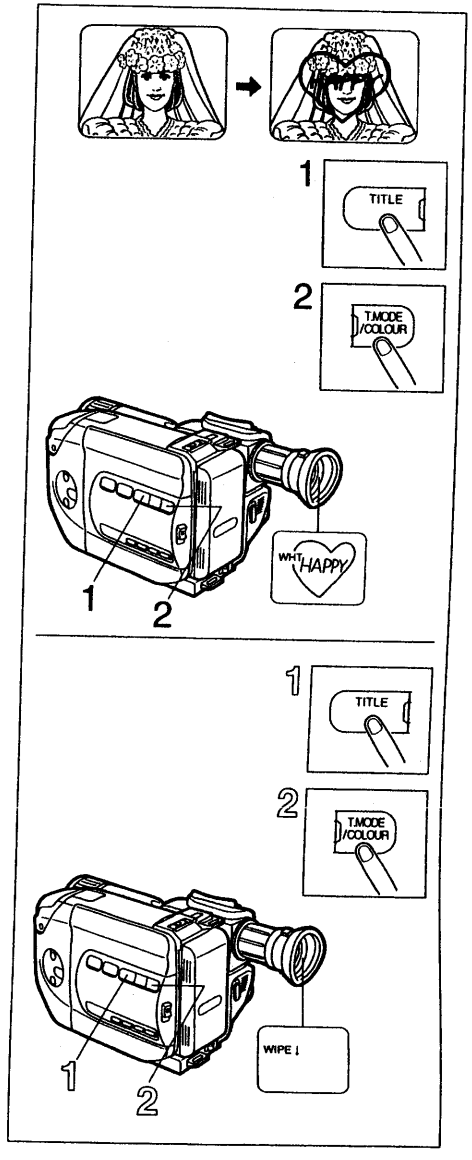
2 Press repeatedly to select the Title Mode.
- By repeatedly pressing this button, the way in which the title is superimposed onto the picture being recorded can be changed in the following order.



1. The title will appear immediately.
2. The title will appear gradually from the top.
3. The title will appear gradually from the bottom.
4. The title will scroll in from the bottom.

- To confirm how the title will later appear during shooting, press the [TITLE] Button again. It will now appear in the selected mode, and the selected colour will also be indicated in the Viewfinder.

Notes:
- Input a title into the memory before selecting the title mode.
- The title mode cannot be selected when the title is displayed in the Viewfinder.



Recording the Memorised Title during Shooting

■ Superimposing a Title at the Beginning of a Shot.

1 Press to make the title appear in the Viewfinder.
- Confirm by the indications in the Viewfinder that the selected colour is as desired. At this time, it is still possible to change the colour.

2 Press to start shooting.

■ Superimposing a Title in the Wipe or Scroll Title Mode at the Beginning of a Shot.

1 Press to make the title appear in the Viewfinder.

2 Press to select the title colour.

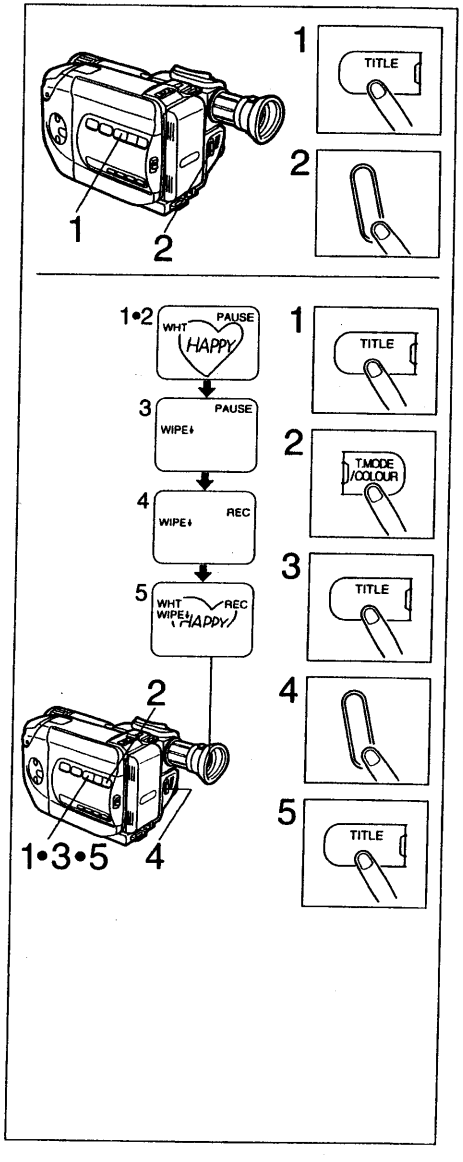
3 Press to make the title disappear from the Viewfinder.
- Confirm by the indications in the Viewfinder that the selected title mode is as desired. At this time, it is still possible to change the title mode.

4 Press to start shooting.

5 After approx. 2 seconds, press.
- The wipe or scroll title will appear in the Viewfinder and it will be recorded in the same way.

■ Superimposing a Title during Shooting
- At the point where you want to insert the title, press the [TITLE] Button. (The title appears in the Viewfinder in the selected title mode and selected colour. At the same time, it is superimposed onto the scene that is being shot.)

■ To Stop the Superimposition of the Title
Press the [TITLE] Button again.



Automatic White Balance Adjustment

Using the Automatic White Balance Adjustment Function

To attain recordings with natural colours, it is necessary to adjust the sensor in the camera to the existing colour of the light. This adjustment is called white balance adjustment.

The Auto White Balance Adjustment Function provides satisfactory results under almost all shooting conditions. (No operation is necessary.)

When the " " Indication is displayed in the Viewfinder, the Movie Camera is not in the Auto White Balance Mode.
To put it in the Auto White Balance Mode, press the [W.B] Button ❶ (the White Balance Adjustment is now set to the Auto Mode) or set the Mode Selector Switch to "AUTO".
- The " " Indication in the Viewfinder will disappear.

- If the Movie Camera is moved from outdoors to indoors during shooting, the picture will initially take on a slightly reddish cast but it will gradually regain its natural colours.
- In the following shooting situations, the Auto White Balance Adjustment Mode may not provide satisfactory results; use the Manual White Balance Adjustment Mode instead:

❶ When shooting under mercury-vapor, natrium or some types of fluorescent lamps.

❷ When intense lighting is used, e.g. from a halogen lamp, or when the colour temperature of the light source is low.

❸ When shooting under lighting conditions which change suddenly.

❹ When shooting outdoors at sunrise or sunset.

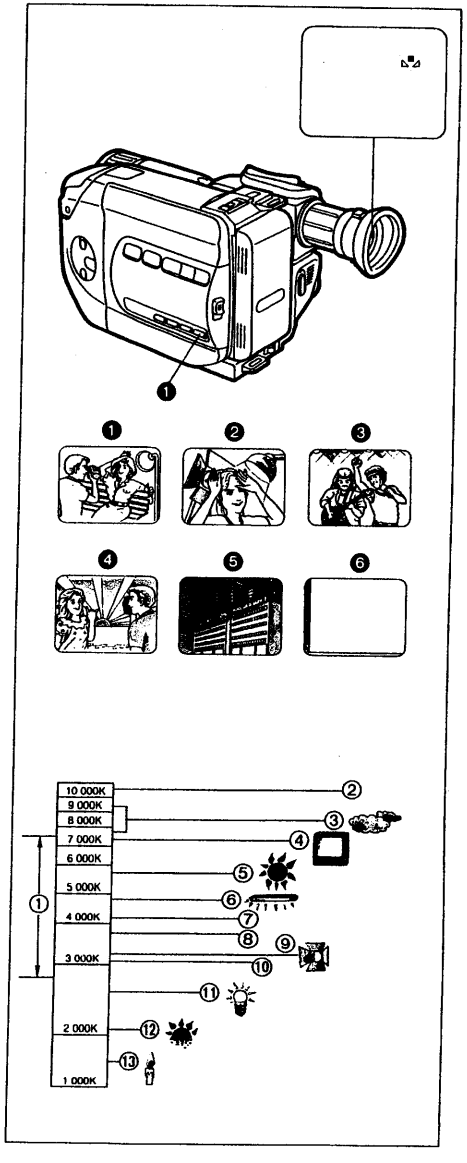
❺ When shooting under firework illumination outdoors at night.

❻ When shooting a subject of a single colour or a subject in front of a single-colour background.
- When shooting under weak illumination.
- When using a grey filter (ND) or other special filters.
- When using a conversion lens.

■ What is the Colour Temperature of the Light Source

The colour temperature of the light source is measured in Kelvin (K). The higher the Kelvin value, the more bluish the light is; the lower the value, the more reddish the light is. This is not directly related to the brightness.

① Control range of the Auto White Balance
② Blue sky
③ Cloudy sky
④ TV screen
⑤ Sunlight
⑥ White fluorescent light
⑦ 2 hours after sunrise or before sunset
⑧ 1 hour after sunrise or before sunset
⑨ Halogen light bulb
⑩ 30 minutes after sunrise or before sunset
⑪ Incandescent electric light bulb
⑫ Sunrise or sunset
⑬ Candlelight



Manual White Balance Adjustment

■ **If there is only one light source:**

1 Attach the Lens Cap to the Lens.

2 Set to "MANUAL".

3 Keep pressed until the screen in the Viewfinder becomes completely white.

4 Press briefly so that the " ⬔ " Indication appears. Then keep this button pressed for more than 1 second.

The following indications in the Viewfinder inform about the state of the adjustment:

❶ " ⬔ " flashes slowly Not adjusted

❷ " ⬔ " flashes rapidly.....During adjustment

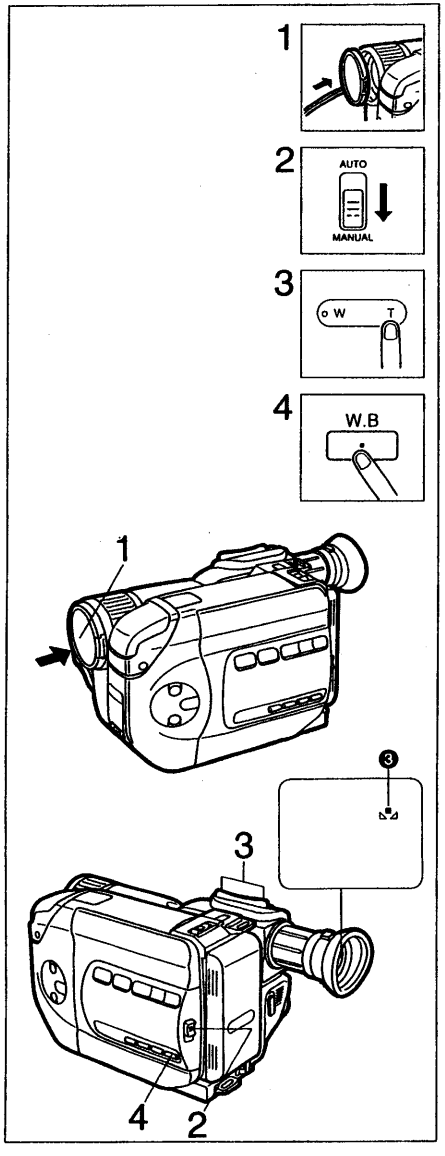
❸ " ⬔ " is lit Adjustment is finished
The Movie Camera is now ready for shooting.

■ **To Change Back to the Auto White Balance Adjustment Mode...**

Press the [W.B] Button, or set the Mode Selector Switch to "AUTO".
•The " ⬔ " Indication in the Viewfinder will disappear.

■ **Automatic Recall of the Previous White Balance Setting**

•After setting the [OPERATE] Switch to "OFF" and later to "CAMERA" again, the " ⬔ " Indication flashes slowly, however, the previous white balance setting is still maintained.
However, to ensure the best possible colour reproduction, adjust the white balance again.
The previous white balance setting is also maintained after pressing the [REW/⏪] Button to confirm the end of the previously recorded scene.
However, after removing the Battery Pack (or disconnecting the AC Adaptor from the Movie Camera) the previous white balance setting is no longer maintained.
•When moving the Movie Camera from indoors to outdoors or vice versa, be sure to adjust the white balance again, as the colour of the light has changed considerably.



Manual White Balance Adjustment (cont'd)

■ **If there are several light sources or if the illumination is weak (indoors, etc.):**

1 Set to "MANUAL".

2 Remove the Lens Cap.

3 Point the Movie Camera at white paper or at another purely white object.

4 Keep pressed until the screen in the Viewfinder becomes completely white.

5 Press briefly so that the " ⬔ " Indication appears. Then keep this button pressed for more than 1 second.

The following indications in the Viewfinder inform about the state of the adjustment:

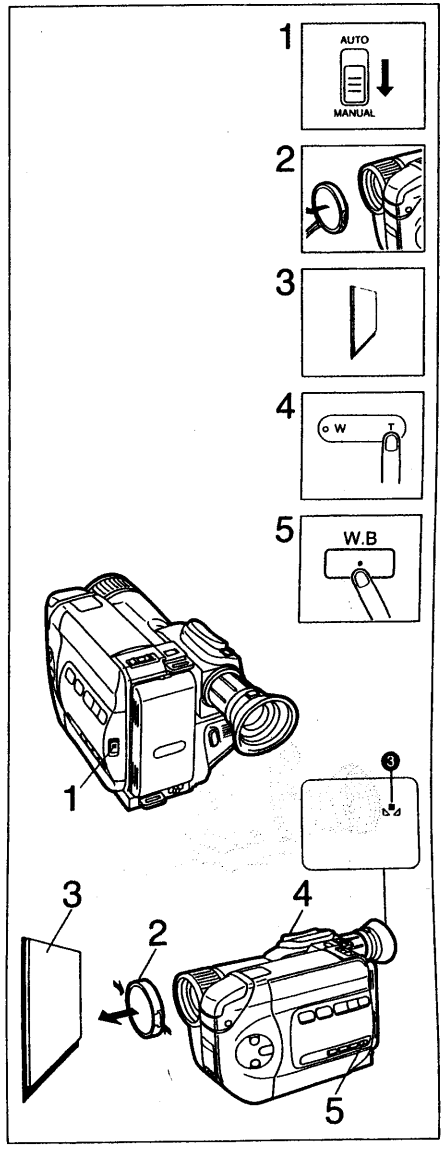
❶ " ⬔ " flashes slowly Not adjusted

❷ " ⬔ " flashes rapidly.....During adjustment

❸ " ⬔ " is lit Adjustment is finished
The Movie Camera is now ready for shooting.

■ **To Change Back to the Auto White Balance Adjustment Mode...**

Press the [W.B] Button, or set the Mode Selector Switch to "AUTO".
•The " ⬔ " Indication in the Viewfinder will disappear.



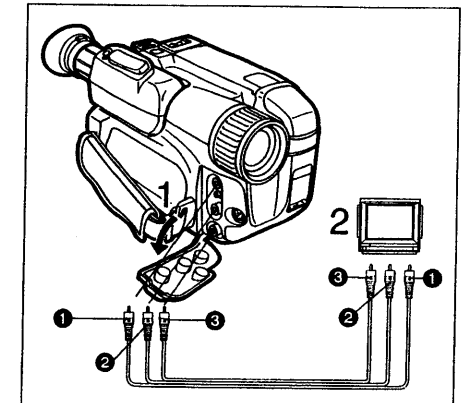
Playback via a TV Set (Connections)

■ Playback via a TV Set with AV Input Socket
(Using the Supplied AV Output Cable)
•Turn off the Movie Camera and the TV set.

1 Open the Socket Cover.

2 Connect the Movie Camera to the TV set.

Movie Camera		TV Set
Audio Output Socket (L) ❶	⟷	Audio Input Socket (L) ❶
Audio Output Socket (R) ❷	⟷	Audio Input Socket (R) ❷
Video Output Socket ❸	⟷	Video Input Socket ❸



■ Playback via a TV Set without AV Socket
[Using the RF Adaptor (Supplied)]
•Turn off the Movie Camera and the TV set.

1 Open the Socket Cover.

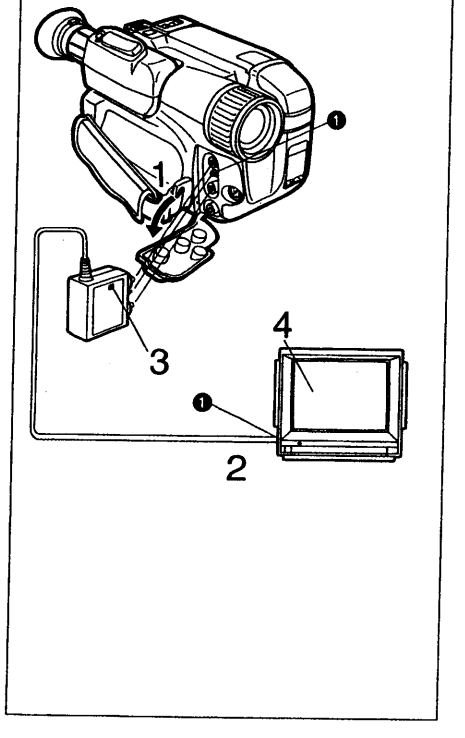
2 Connect the Movie Camera to the TV set.

Movie Camera — TV Set

VIDEO OUT
❶ RF DC OUT ⟷ RF adaptor ⟷ ❶ RF IN
AUDIO OUT

3 Set the PAL System Selector Switch to the correct position.
For the Southeast Asia region, set the RF Converter Channel Selector at "G" position.

4 Select an unused TV programme position (channel).
•Follow the tuning procedure outlined in the instruction booklet for your TV set to re-tune your TV set to the UHF transmission channel 36. The camera picture now appears on the TV screen.
•If in doubt, consult your local video dealer.



Playback

■ How to Play Back in the Viewfinder
(Playback from the Beginning of the Tape)
•The recorded tape can be played back in the Viewfinder or on a connected TV set.

1 Insert the recorded video cassette.

2 Press and slide to "VTR".

3 Press.
•The tape will stop automatically when it reaches its beginning.

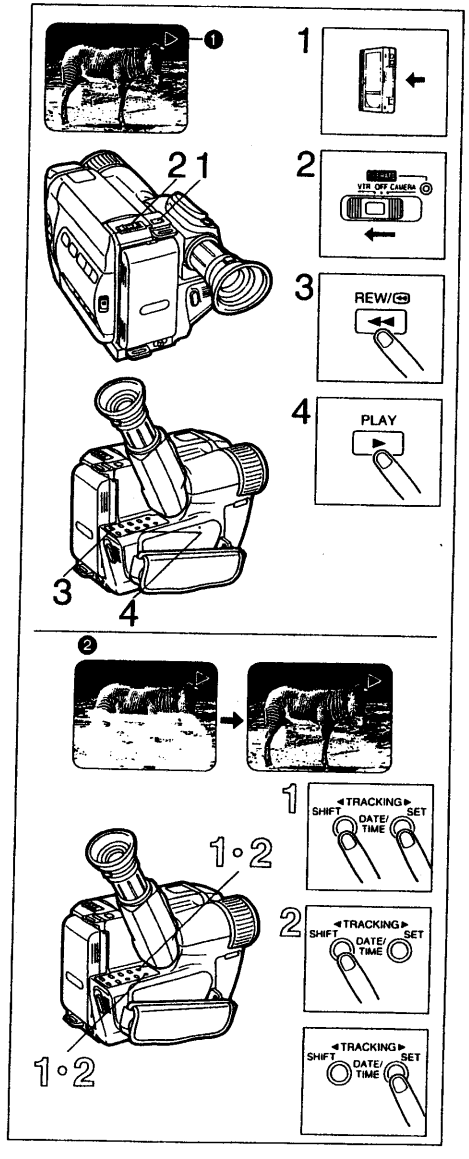
4 Press.
•The playback starts.
The Playback Indication "▷" ❶ appears in the Viewfinder.
•The tape will be rewound automatically when it reaches its end.

■ To Stop the Playback...
Press the [STOP] Button.

■ How to Adjust the Tracking
If the picture is distorted by noise bars ❷ during playback, the tracking needs to be adjusted.

1 Press both the [◄ TRACKING] and [TRACKING ►] Buttons simultaneously.

2 Eliminate any noise bars by adjusting the tracking with the [◄ TRACKING] or [TRACKING ►] Button.
•When playing back a Video cassette which has been recorded on another movie camera, it may not be possible to eliminate these noise bars completely.



Quick Reference Guide to the Indications in the Viewfinder

(1) Remaining Tape Time Indication
- It shows that the recording time left is 30 minutes.
- The time is indicated in hours and minutes. When there are less than 2 minutes left, the Remaining Tape Time Indication flashes.
- While the Movie Camera calculates the remaining tape time, the "R" indication flashes.

Note:
When inserting a new tape, if the Tape Length Indication does not match the video cassette being used, the remaining time indicated will not be correct.

(2) The Tape Length Indication
- The Tape Length Indication shows the total length of the video cassette being used.
- Select the tape length (T30 or T45) with the [EC30/45] Switch. Depending on the selected recording speed (SP or LP), the indication is different as shown below:

SP: "T30" 30 minutes of tape (EC-30, SEC-30),
"T45" 45 minutes of tape (EC-45, SEC-45)
LP: "T60" 60 minutes of tape (EC-30, SEC-30),
"T90" 90 minutes of tape (EC-45, SEC-45)

(3) Title Colour Indication
- It shows the colour of the title being superimposed in abbreviated form, e.g. WHT=White.
- The title colour can be selected when the title is displayed in the Viewfinder.

(4) Title Mode Indication

WIPE ↓ The title appears gradually from the top to the bottom.
WIPE ↑ The title appears gradually from the bottom to the top.
SCROL The title moves into the picture from the bottom.

- The title mode can be selected when the title is not displayed in the Viewfinder.

(5) Image Stabilizer Indication
"✋"
- Turn the Image Stabilizer Function on or off by pressing the [STABILIZER] Button. The indication "✋" is displayed when it is turned on.

(6) Digital Zoom Indication
- Select the zoom range by pressing the [ZOOM] Button.

"D.ZOOM 1" ("D" means Digital.)
The zoom range is expanded to up to ×12.
"D.ZOOM 2"
The zoom range is expanded to up to ×36.

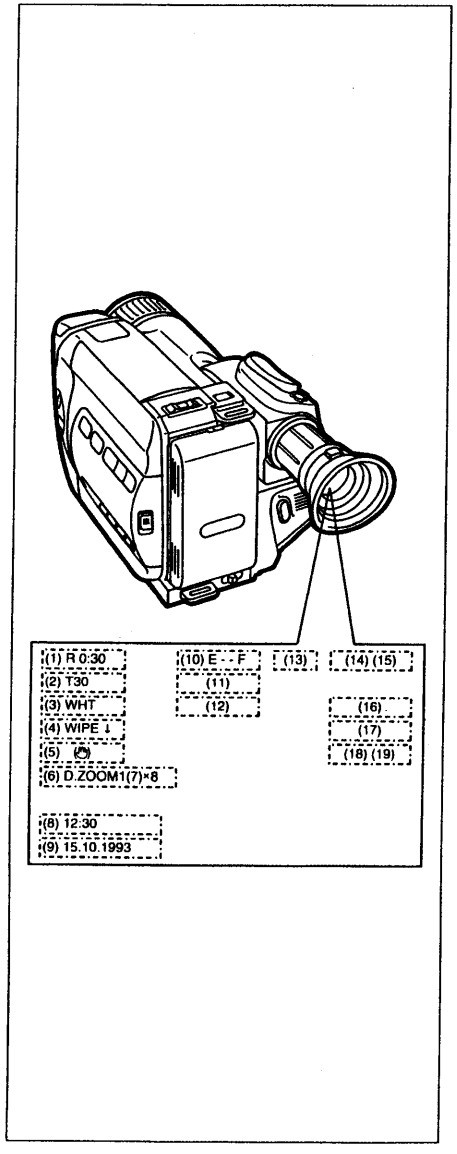
(7) Magnification Ratio Indication
- It lights up when the Zoom [W] or [T] Button is kept pressed, and it goes out one second after releasing either of the two buttons.

(8) Time Indication
"12:30"
- The current time (hour and minute) is displayed.
The time must initially be set.
- The time is shown in the 24-hour clock system.
- It is possible to display the date alone, or the time and date together.

(9) Date Indication
"15.10.1993"
- The year, month, and day are displayed.
The date must initially be set.

(10) Remaining Battery Power/Index Indication "E--F"
- The "–" indications begin to disappear from right to left as the power of the Battery Pack is being used up.
- When switching the Movie Camera on with the Battery Pack attached, the entire indication "E--F" will initially be displayed for approx. one minute. After that, the actually remaining battery power will be displayed.

"INDEX"
- This indication flashes when a recording is started and it indicates that an index signal is being recorded.



Quick Reference Guide to the Indications in the Viewfinder (cont'd)

(11) Tape Counter/Elapsed Tape Time Indication
"0:23.45"
- The elapsed tape time, in either shooting or playback mode, is indicated in hours, minutes and seconds.
- By pressing the [M/RESET] Button for more than one second, it is possible to reset the Tape Counter to "0:00.00".
- When a cassette tape is ejected, the tape counter is automatically reset to "0:00.00".

"M 0:23.45"
- To be able to play back a certain scene at a later time, press the [M/RESET] Button briefly at the beginning of that scene. When the [▷▷]FF] Button or the [REW/◁◁] Button is pressed later, it is possible to locate this scene easily.

("M" means Memory.)

(12) Warning/Alarm Indications
The following indications are displayed to inform about the conditions of the Movie Camera.
"DEW", "⊗", "⇦", "■", "⛁", "END", and "INDEX".

(13) Backlight Compensation Indication
- Press the [BLC] Button to select the desired degree of backlight compensation.

This is only possible if the Mode Selector Switch is set to "MANUAL".

(14) Tape Running Indications
Depending on the operation being currently performed by the Movie Camera, one of the following indications appears.

"▷" During Playback
Camera Search (in forward direction)
"▮▮" During Still Playback
"◁◁" Rewind/Review Mode
Camera Search (in reverse direction)
"▷▷" Fast Forward/Cue Mode

(15) Shooting Mode Indications

"REC" During Shooting
"PAUSE" During Shooting Pause
"SNAP" During Snapshot Shooting
"CHK" During Rec Review

(16) Recording Speed Indications

"SP" Standard Play speed mode
"LP" Long Play speed mode
- The mode can be selected with the [SP/LP] Switch.

(17) Manual White Balance Indication
In the Manual White Balance Adjustment Mode:
" ⛶ " Indication flashes slowly Adjustment is not made.
" ⛶ " Indication flashes rapidly While adjustment is being performed.
" ⛶ " Indication is lit The adjustment has been completed.

In the Automatic White Balance Adjustment Mode (initial mode), none of these indications is lit.
- Adjust the White Balance by pressing the [W.B] Button. This is only possible if the Mode Selector Switch is set to "MANUAL".

(18) Shutter Speed Indications
- The desired shutter speed can be selected by repeatedly pressing the [SHUTTER] Button. This is only possible if the Mode Selector Switch is set to "MANUAL".

The numbers in the Shutter Speed Indication show fractions of a second, e.g. 1/120 = 1/120th of a second.
- The initial shutter speed is 1/50 sec. (no indication).
- When the Image Stabiliser Function is turned on, the "1/120" Indication is lit.

(19) Manual Focus Indication
"MF" ("MF" means Manual Focus.)
The Automatic Focus Mode can be turned on or off by pressing the [FOCUS] Button. When adjusting the Focus manually, press the [FOCUS+] or [FOCUS–] Button. This is only possible if the Mode Selector Switch is set to "MANUAL".

